Evaluating Decentralized Policies: How to Compare the Performance of Economic Development Programs across Different Regions or States

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Abstract: This paper proposes an empirical method to evaluate decentralized economic development programs with heterogeneous characteristics implemented in different regions or states. The evaluation design developed in the paper is a comparative analysis that operationalizes differences in regional policy features and controls for pre-intervention heterogeneous characteristics of targeted areas. The proposed method is illustrated and tested through the evaluation of the U.S. Enterprise Zone (EZ) programs. The results of the analysis show that the proposed evaluation design is an effective tool for turning the heterogeneity of decentralized economic development programs from a threat to the validity of the analysis into a great opportunity for testing the effectiveness of a variety of region (or state) specific policy implementation features.

Keywords: comparative evaluation, economic development programs, decentralized policies, longitudinal data, propensity score.

JEL classification: R58, O18, H71, C23

Introduction

Decentralized economic development programs, such as the number of regional initiatives co-funded by the European Regional Development Fund (E.R.D.F) in the E.U. "Objective 1" (*Ob.1*) and "Objective 2"(*Ob.2*) areas[1] and the U.S. state Enterprise Zone (EZ) programs, are often implemented with rather heterogeneous policy features across the various regions or states that administer the program. Region- or state-specific policy implementation features of decentralized economic development programs commonly vary in the type and the monetary generosity of the incentives offered to businesses, the criteria for selecting the targeted areas of the intervention, and the business eligibility rules for receiving the program incentives. Evaluation of the incentive packages offered in single target sites, in the form of case studies of one individual regional implementation of the program is not a satisfactory option as the external validity of the results is compromised by the wide heterogeneity of the policies implemented across different regions or states. For the U.S. state EZ programs and the E.U. economic development programs in *Ob.1* and *Ob.2* areas, for example, positive or negative findings from the experience of one regional or state implementation are difficult to generalize to other places or times, since it is not possible to disentangle whether these results were determined by some region- (or state-) specific policy implementation features or by the relatively low or high monetary generosity of the program.

More informative than single case studies can be comparative evaluations of more than one regional or state implementation. For the EZ programs and the economic development initiatives implemented in the E.U. *Ob.1* and *Ob.2* areas, such types of evaluations are studies that compare outcomes from multiple regional or state implementations of the program. These types of comparative evaluations are generally not easy to perform due to the difficulties in gathering the required data on the location of the target areas, the designation date of the regional programs, the specific local policies and the outcome measures used to assess the success of the program. If carefully performed, however, comparative evaluations use the heterogeneity of the decentralized implementations of the program to their advantage to provide valuable evidence to help refine future economic development interventions. This is because decentralized programs often provide valuable variations of specific policy features across the different regions or states that implement the program. Such variations can be incorporated into the analysis to assess which implementation features are the most effective for enhancing the future performance of the program.

In this paper I develop a comparative evaluation that investigates the impact of selected regional or state policy implementation features on employment and other business outcomes, (such as plant output and capital expenditures). The evaluation method proposed in the paper is designed to assess whether certain regional (or state) policy implementation features are more appropriate for spurring new business creation, and on the other hand, whether other regional (or state) implementation features are better suited for retaining existing businesses. This type of evidence can be very insightful to reshape future geographically-targeted economic development efforts, as different policy implementation features might be best appropriate in different circumstances. For example, policy implementation features that are found to be effective in attracting new establishment start-ups can be better directed to support the development efforts applied to areas with substantial expansion potential such as newly equipped industrial parks or underutilized land sites at the edge of the urban texture, rather than being directed to reverse the decline of existing business districts.

As regions and/or local sites can be eligible for economic development programs only if they show signs of economic distress, the data used to evaluate such programs are non-experimental and non-random by nature. This poses the challenge to control for selection bias in retrieving program impact estimates. The evaluation method proposed in this paper address the selection bias issue by estimating the designation probability of each target area based on pre-designation

[1] *Ob.1* areas are the E.U. most economically disadvantaged regions: Southern Italy, Portugal, Greece, Eastern Germany, Northern Sweden and Finland, Ireland, Northern Ireland, Western and Southern Spain, Northern Scotland, and Western Wales. Ob.2 areas are instead the E.U. sites where industrial activities are sharply declining. Such sites are moderately sized regions located in almost every

characteristics. Differences in these characteristics are then controlled for by including the predicted probability of zone designation in a regression of the outcome variable (either employment, value of shipments or capital expenditures) on indicators of zone status and program features.

The proposed evaluation method is illustrated throughout the paper using as an empirical case study the evaluation of the U.S. Enterprise Zone (EZ) programs. The U.S. EZ programs were initiated autonomously by a number of states, rather than by the Federal Government as a policy initiative providing tax and other business incentives aimed at encouraging businesses to relocate to (or to avoid leaving) economically depressed areas. Because the states autonomously initiated the EZ policies with the involvement of county and local governments of the targeted areas, a large variety of programs emerged. Thus, the U.S. EZ programs represent an excellent empirical application to test the proposed method and to illustrate the challenges and the opportunities that decentralized interventions pose to evaluators.

The results of the analysis from this empirical application show that the evaluation design proposed in the paper is an effective tool for testing a number of policy implementation features that would not be otherwise possible to empirically evaluate in centralized-types of interventions. The policy features tested in this paper provide findings that have relevant policy implications to effectively refine future geographically-targeted economic development initiatives.

The remainder of the paper is organized as follows. The next section illustrates how to operationalize heterogeneous policy characteristics. The third section describes the proposed evaluation design. The fourth section develops the empirical method of analysis and the data used in the proposed empirical application. The fifth section illustrates the results of the analysis. The two final sections of the paper discusses the major findings of the paper and offers concluding remarks.

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How to Operationalize Heterogeneous Policy Implementation Features

To effectively evaluate decentralized economic development programs, it is crucial to sort out and correctly operationalize the heterogeneous policy characteristics implemented in the different regions or states administering the program. On this subject, it is difficult to provide specific and universal guidelines as each decentralized program has its own specific features. Quite commonly, however, the differences among the various region- (or state-) specific policy implementation features are related to the following factors: the monetary value of the incentives offered to targeted businesses, the designation process to select the target areas, the requirements that targeted businesses have to meet for receiving the program incentives and the portion of state (or regional) land covered by the target areas.

Using the U.S. Enterprise Zone (EZ) programs as a case study, the following is an illustration on how differences in the heterogeneous region- (or state-) specific implementation features can be measured and captured in policy variables to be used in empirical evaluation models.

The monetary value of zone incentives should be measured in such a way to capture the estimated competitive advantage offered by investments performed in zone locations compared to the same investments performed in non-zone locations. Such a competitive advantage should be operationalized by estimating the internal rate of return of an investment in a new plant, located in both an EZ area and a non-EZ area within the same state, made by one typical firm for each of the industrial sectors representing the state economy [2]. The difference between the return from the investment in the EZ area- and the non EZ area- plant should be then calculated and used as estimate of the monetary generosity for each of the state EZ programs included in the data sample [3]. This within-state differential estimate approach is motivated by the fact that development incentives are most likely to affect business location decisions at the margin, as tie-breakers between similar and spatially adjacent areas within the same state (e.g. Bostic 1996, Wilder and Rubin 1996, Bartik 1991, 1995). This is because the degree of variation in labor, tax, and other business costs, as well as in revenue potential across different regions and states is very likely to be larger than the degree of variation in development incentives. Thus, businesses' inter-regional (or inter-state) location decisions are likely to be primarily determined by these fundamental cost and revenue variations rather than by the availability of development incentives.

The process for selecting the areas designated as EZs is based in many states on minimal unemployment, income or education thresholds to be met by eligible communities. Eligible communities are then required to submit a formal application for EZ designation which is typically awarded to a large sub-sample of the applicants. A distinctive feature of the EZ application process that has been regarded as potentially important for the effectiveness of the program is the provision of a strategic business plan among the application requirements. In many cases (Bostic 1996), the strategic planning portion of the application process has been regarded as beneficial by itself for local economic development as it promotes a more productive coordination of different local development resources. Thus, the designation process for selecting the target areas should be primarily operationalized with a dummy variable for whether or not a state EZ program requires the completion of a strategic business plan among its zone application requirements.

State EZ programs often tie incentives awarded to businesses to either the number of new jobs created or the size of the capital investment performed in the zone. As zone incentives may also have an impact on factor prices, incentives that reduce the price of capital may also have a substitution effect by inducing businesses to substitute capital for labor (Wilder and Rubin 1996), or vice versa. To effectively test such hypotheses, the business requirements for receiving the program incentives should be operationalized with both a job- and a capital-requirement dummy variable.

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[2] These estimates are obtained adopting Fisher's and Peters's (1998) "hypothetical firm" model (the Tax and Incentive Model –TAIM) that fully incorporates both tax and non-tax incentives.

[3] A more detailed account on how to operationalize the monetary value of the EZ incentives can be found in Bondonio and Engberg (2000).

Finally the territorial extension of the program should be measured as the percentage of state land covered by EZ areas. This solution allows the degree by which the program incentives are spread on a large portion of the state (rather than focusing on few critical target sites) to be captured in a single informative parameter, and to test whether the territorial extension of the program is a relevant factor to explain its degree of success.

The Evaluation Design

The purpose of the evaluation design proposed in this paper is to assess whether decentralized economic development programs achieve their immediate goal of retaining existing firms and attracting new ones. It is widely agreed that successful economic development programs should bring more business activity to both new and existing targeted establishments (e.g. Bartick 1991, Greenbaum 1998, Wilder and Rubin 1996). Empirical evidence of such increment in business activity would be found in increased employment, sales, and capital expenditures. Thus, three variables are proposed as outcome measures for the evaluation: employment (to measure whether zones create and retain jobs), total dollar value of shipments (to measure whether plant output has been affected), expenditures on new buildings and machinery(to assess whether zone incentives encourage increased capital expenditures).

Although, attracting new business and jobs is certainly the most headline grabbing goal of most decentralized economic development programs, retaining businesses and jobs is also often stated as an important goal (e.g. Dowall 1996). This is especially true when the promoters of the program have in mind to revitalize declining business districts. Investigating whether certain region- (or state-) specific policy implementation features are more appropriate to spur new business creation, and on the other hand, whether other region-specific features are better suited for retaining existing businesses, can be very beneficial to reshape future economic development efforts. For example, capital is often cited as a primary concern for start-up businesses and new branches of existing businesses (Wilder and Rubin 1996). Thus, it can be argued that capital and finance incentives for the few first years of a start-up business plan are typically more attractive than tax incentives, since new businesses do not expect to make a profit in the first years of operation. In a survey study of a number of U.S. Enterprise Zones (EZs), Sheldon and Elling (1989) found that new firms reported to be significantly affected by EZ program services (e.g. technical assistance and streamlines regulations), while expanding businesses reported to be more affected by financial assistance (e.g. low-rate financing, venture capital and fee waivers). If the specific policy features implemented in some regions (or states) are found to be particularly effective in attracting new start-up establishments, those features, in the future, should be adopted to support all regional (or state) economic development initiatives targeting areas such as newly equipped industrial parks, rather than initiatives aimed at reversing the decline of existing business districts. Simirlarly, if other region-specific policy features are found to be effective in retaining existing zone businesses, those features should be used to support the future interventions aimed at saving existing business districts, rather than to support the investment aimed at boosting the economic growth of unexploited sites in areas specifically set apart to host new industrial development.

To address these types of research question, it is crucial to include in the analysis the policy implementation variables illustrated in the second section of the paper, and to distinguish, for each outcome variable (i.e. employment, sales and capital expenditures), the pre-post intervention changes accounted for by three different types of business units: births, deaths, and ongoing establishments. To implement this distinction, establishment-specific panel data need to be available for the analysis. With such data in hands, birth establishments can be then defined as business units that have positive employment in the post-intervention time, but had zero employment prior to the program intervention. Deaths can be defined as business units that have zero employment in the current time, but had positive employment prior to the program intervention. Ongoing establishments can be defined as business units that have positive employment levels, both before and after the program intervention.

The intersection among the three growth outcome measures and the three different “types” of business units identifies nine cells. The establishment-specific data inside each of the different cells then need to be aggregated at the geographical level corresponding to that of the areas targeted for the program intervention. If, for example, the target areas of the program intervention are provinces (or regions) of E.U. countries, as the case of the initiatives in Ob.1 and Ob2. areas, then the data need to be aggregated by provinces (or by regions). If, instead, the target areas are smaller sites

corresponding to the size of Postal Code districts, as the case for the U.S. Enterprise Zone programs, then the data need to be aggregated by U.S. Postal ZIP code areas.

The Empirical Method: Conditioning on a Propensity Score

The proposed empirical method to estimate the impact of policy implementation variables on each type of establishments (births, deaths and on-going establishments) is an econometric model, referred to as conditioning on a propensity score (Bondonio 2000, Bondonio and Engberg 2000), that compares the performances of target and excluded areas while capturing and controlling for observable pre-intervention differences between the two groups of areas. This model is implemented by first estimating (through a probit or logit equation) the probability for each geographic area in the data sample to become the target of the program intervention as a function of a number of economic and socio-demographic characteristics recorded prior to the beginning of the program intervention:

$$P(D_i=1) = \Phi(X_i\gamma + \phi_j), \qquad (1)$$

where: X_i is a matrix [*(N x K)*, being *K* the number of observable characteristics measured at a pre-intervention time *(t-r)*and *N* the total number of areas in the data sample], ϕ_j is a set of (*J-1*) region (or state) dummy variables [with *J* being the total number of regions (or states) in the data sample]. The predicted value $\hat{D}_i = F(X_i\hat{g} + \hat{f}_j)$ from equation (1), referred to as propensity score (e.g. Rosenbaum and Rubin 1983, 1984, Dehejia and Wahba 1998a, 1998b, and Heckman, Ichimura and Todd 1997, 1998), represents the estimated probability that an area *i* is selected for treatment. This probability can be interpreted as a single area-specific parameter (those value ranges 0-1) that summarizes the pre-intervention economic and social conditions of area *i*. The predicted probability $\hat{D}_i$ estimated from equation (1) is then added as a control variable to an outcome equation where the independent variable ($\Delta \text{Ln } Y_{it}$) is regressed on a treatment assignment variable [D_{it}=1 if the area *i* is a target area at time *t*, D_{it}=0 otherwise], a set of policy implementation variables (pol_1_{it}, …pol_n_{it}) and a set of time (a_t) and region (or state) (f_j) dummy variables:

$$\Delta \text{Ln } Y_{it} = \alpha_t + \phi_j + \lambda_j \hat{D}_i + \delta D_{it} + [\theta_1(EZ_{it} * pol\_1_{it}) + \ldots + \theta_n (EZ_{it} * pol\_n_{it})] + u_{it}. \qquad (2)$$

The conditioning on a propensity score approach of equations (1) and (2) is well suited for the evaluation of geographically-targeted economic development programs for at least two reasons (Bondonio 2000, Bondonio and Engberg 2000). First, very often the observable social and economic pre-designation characteristics of the areas targeted by the program intervention (such as regions, provinces, Postal Code areas) cover virtually all the variables that drive the treatment assignment process. Second, the treatment assignment process leaves very little room for self-selection into treatment by local administrations based on unobservable variables.

A Case Study: the Evaluation of U.S. Enterprise Zone Programs

To illustrate in detail how to implement the empirical method proposed for the analysis it is useful to use as a case study the comparative evaluation of the Enterprise Zone (EZ) programs of five states: California, Kentucky, New York, Pennsylvania and Virginia. These five states are sampled for the analysis (among the forty or more states that, to date, have implemented their own version of an EZ program) as the result of a choice based on the longevity of the programs and the ease of gathering geographic and policy information about the programs. The specific policy implementation features of these 5 state programs (operationalized following the guidelines illustrated in the second section of the paper), along with the program starting dates and the number of zones are summarized in Table 1.

Table 1

Data

The data used to develop the analysis of the five states' EZ programs were collected from various documents and sources provided by state EZ program administrators and the U.S. Census Bureau. Zone location and designation date information were retrieved primarily through interviews and questionnaires from state EZ and local development administrators. Zone locations were mapped in terms of U.S. postal ZIP code areas. Zip code areas were encoded as zone-ZIPs if they encompass any significant portion of an actual EZ areas and as non-zone ZIPs if they do not encompass any portion of an EZ area.

Pre-designation demographic, income, poverty, unemployment and population density information, were obtained from the U.S. Census Bureau 1980 Decennial Census files. These data, recorded by Census tracts, needed to be allocated to ZIP code areas to be used in the analysis. This allocation was performed using the MABLE GEOCORR[4] geographical correspondence engine that determines the degree of overlap between different spatial units.

Employment, value of shipment and capital expenditure data were obtained from the quinquennial Census of Manufactures (CM) portion of the U.S. Census Bureau' Longitudinal Research Database (LRD). The CM data includes information on every U.S. manufacturing plant with five or more employees, allowing each establishment to be tracked over time through a unique identification number assigned to every single plant. CM data were available for the analysis in years 1977, 1982, 1987, 1992.

Modeling Zone Designation

To adequately control for pre-existing differences among areas and states in the data sample, the propensity score model of equation (1) and (2) is implemented by first estimating a separate probit regression for each of two state clusters. The five states included in the data sample are clustered based on the criteria mentioned in the EZ state legislations for selecting zone areas. This clustering solution is a good compromise between two extreme options: an extremely flexible model in which a separate probit regression is used for each state included in the analysis, and a very restrictive model in which one common regression is used for all states in the data sample[5].

The first cluster of states includes California, New Jersey and Pennsylvania, for which official EZ selection guidelines include primarily income, unemployment or poverty indicators. The second cluster of states includes New York and

[4] MABLE/GEOCORR is available on the World-Wide Web at http://plue.sedac.ciesin.org/plue/geocorr/.

[5] Neither option is suited for the evaluation of EZ programs (and of geographically-targeted economic development programs in general) because of the following reasons. Estimating a separate regression for each state is unfeasible for the entire data sample as among the five states included in the analysis, a few of them have a too small number of ZIP zones. Estimating one common regression for the entire

Virginia for which official zone selection guidelines also include criteria based on land availability or buildings vacancy, in addition to unemployment, income or poverty indicators. Each probit regression (one for each cluster of states) expresses zone designation as a function of five pre-designation variables derived from 1980 Decennial Census data and three pre-designation (1977-82) growth variables derived form Census of Manufacturing (CM) data. The Decennial Census variables are used to capture poverty, unemployment and income characteristics along with few basic demographic characteristics, while the CM data capture growth in employment, capital expenditure and value of shipments prior to the beginning of the zone selection process.

The probit specification for the second cluster of states (New York and Virginia) differs from the first-cluster specification as it also includes two 1980 Census housing market variables. These two additional variables are included in the specification for New York and Virginia because these two states have specific policy selection guidelines that also include housing condition indicators. The two probit specifications used in the analysis are illustrated in equations (3) and (4):

$$P(EZ_i=1) = ?\ (CEN80_i\alpha + CM77\_82_i\,\beta + \phi_j), \qquad (3)$$

i = ZIP areas
j = cluster I states (CA, NJ, PA)

$$P(EZ_i=1) = ?\ (CEN80_i\alpha + CM77\_82_i\,\beta + HOUS80_i\,\delta + \phi_j), \qquad (4)$$

i = ZIP areas
j = cluster II states (NY, VA)

where: EZ_i equals 1 if ZIP area *i* is ever a zone in any year from 1982 to 1992, and 0 otherwise; $CEN80_i$ are the set of 1980 Census variables capturing unemployment, poverty, per capita income and some demographic characteristics of each ZIP area *i* in the data sample; $CM77\_82_i$ are the CM growth variables; $HOUS80_i$, are the 1980 Census variables expressing ZIP *i*'s characteristics of the housing market; δ_j, finally, is a set a state dummy variables. Table 2 illustrates the complete set of independent variables included in equations (3) and (4), along with their means and standard deviations sorted by zone ZIPs and non-zone ZIPs.

Table 2

Estimating Zone Outcomes

To estimate the impact of EZ designation and of specific policy implementation features on employment, value of shipments and capital expenditures, the predicted probabilities from equations (3) and (4) are included in a model where the outcome variable [measured as the growth rates recorded within the two 5-year periods covered by the available CM data (i.e. 1992-87 and 1987-82)] is regressed on a set of state dummies (ϕ_j), a year dummy (α_t), an EZ status variable, and a couple of interaction terms between the EZ status variable and a policy implementation variable:

$$Ln(Y_{it}/Y_{it-5}) = \alpha_t+\phi_j + PR\_I_i\delta_1 + PR\_II_i\delta_2 + EZ_{it}*[(t- t^d_i)/5]\,\delta_3 + EZ_{it}*mon_i*[(t-t^d_i)/5]\,\delta_4 + EZ_{it}*pol_{it}*[(t-t^d_i)/5]\,\delta_5 + u_{it}. \qquad (5)$$

data sample, instead, does not allow to effectively capture across-state differences in the pre-existing area characteristics that drive the zone selection process.

In equation (5), PR_I and PR_II are the predicted probabilities from equation (3) and (4) respectively. The variable PR_I is constructed as the predicted probability from equation (3) for all the ZIPs located within the states included in cluster I, and zero for all the other ZIPs. Likewise, PR_II contains the predicted probability from equation (4) for all the ZIPs included in cluster II and zero for all the other ZIPs. The zone status variable EZ_{it} equals one if a ZIP contains a zone that is in existence at time t, and zero otherwise. The term $[(t- t^d)/5]$ is included to express the portion of the quinquennium ending in year *t* for which a zone is in existence (to correctly express such a portion, $(t- t^d_i)/5$ is capped at 1, when more than 5 years elapsed between *t* and the time of zone designation t^d). The term $EZ_{it}*mon_{it}$ equals to the monetary value of the EZ incentives (as measured with the "hypothetical firm" method illustrated in the second section of the paper) if the ZIP area *i* is a ZIP zone at time t, and zero otherwise. The term $EZ_{it}*pol_{it}$, finally, is the interaction between the EZ status variable and one of the four remaining policy implementation variables described in the second section of the paper (i.e. *pol* is equal to either the portion of state land covered by zones or one of the three dummies used to illustrate whether or not: a strategic business plan is required, tax incentives are tied to the number of new jobs created, and tax incentives are tied to capital investment).

The model illustrated in equation (5) is implemented with a number of different specifications. Each specification differs from the other because of the inclusion of a different dependent variable (Y) among the ones listed in Table 3, and because of the inclusion of different pairs of policy implementation variables.

Table 3

The set of dependent variables used in the analysis is formed by intersecting the three outcome measures (i.e. employment-, capital expenditure- and value of shipments-growth) with the three different "types" of firm (i.e. births, deaths and ongoing establishments) operationalized for the analysis. The complete set of specifications adopted to implement the model of equation (5) is illustrated in Table 4. Due to space constrain, regression results are presented in the paper only for those specifications (highlighted in bold in Table 4) that yield significant impact estimates, while the complete list of regression results is available upon request to the author.

Table 4

Results

Probability of Zone Selection- Table 5 reports the results from the probit regression of equations (3) and (4). The coefficient estimates of Table 5 highlight which are the actual pre-designation characteristics that drive the selection decision in each cluster of states. In the three states included in cluster I (California, Kentucky and Pennsylvania) zones tend to be placed in areas with low per capita income, slow pre-designation employment growth and high proportion of minority population and population density. New York and Virginia combined, forming cluster II, target instead areas with slow pre-designation employment growth, high proportion of minority population and with low-value housing units.

To test the validity of the clustering solution adopted, the analysis has been replicated adopting the specification of equation (4) [which includes two housing variables] for retrieving the propensity score estimates of the cluster I states. Results from this specification are in favor of the adopted clustering solution, showing that housing criteria do not affect zone designation for the cluster I states[6].

[6] The coefficient estimates for the housing occupancy rate and the average value of housing units are also tested for joint significance trough a standard F-test those results fail to reject the null hypothesis of both coefficients having zero value.

Table 5

Birth-establishment outcomes- Table 6 summarizes the results for the three birth-establishment specifications of equation (5) that yield significant impact estimates for the policy implementation features of interest for the evaluation. The first column of Table 6 reports the marginal impact of zone designation the monetary value of zone incentives and the portion of state land occupied by zone areas on the baseline 5-years employment growth-rate. Zone designation and the portion of state land occupied by zones are estimated to significantly affect the employment baseline growth rate. The estimated impact of zone designation on the baseline growth rate is in the range of 12 percentage points per year. Extending the territorial coverage of the program (resulting in a larger portion of state land occupied by zones) is estimated to marginally lower the yearly baseline employment growth rate of zone-ZIPs by 5.6 percentage points for each one-standard deviation increase in the state land coverage of zones[7].

The second column of Table 6 summarizes the results for the specification (*II.4*), having value of shipments as dependent variable. The marginal impact of zone designation and zone policies on the 5-year baseline growth rate is very similar to the estimated impact on the employment growth rate. Zone designation and the portion of state land covered by zones are also in this case found to significantly affect the baseline growth rate of the dependent variable. Zone designation is estimated to increase the growth rate of value of shipments by 5.9 percentage points per year. The estimated impact of the land-coverage of zones is such that increasing the zone land-coverage by one standard deviation would marginally depress the yearly growth rate of the value of shipments by 4.2[8] percentage points.

Impact estimates of zone designation and zone policies on capital expenditures are reported on the third column of Table 6. Results are similar to those for the employment (*I.4*) and the value of shipment (*II.4*) specifications, with the estimated coefficient of zone designation highlighting an increase of 6.1 percentage points in the baseline growth rate and the coefficient of zone land extension of zones highlighting a decrease of 4.0[9] percentage points in the baseline growth rate per each one-standard deviation increase of zone land occupation.

Table 6

Existing-establishment outcomes- Results for the existing-establishment specifications are summarized in Table 7. Having incentives tied to hiring requirements is found to be the only EZ feature that marginally affects the baseline growth of zones' employment (specification *IV.2*). Awarding zone businesses with incentives that are proportionate to the number of new jobs created is estimated to marginally increase employment growth by 4.54 percentage points per year.

The second and third column of Table 7 report estimates for the value of shipment (*V.1*) and capital expenditure (*VI.1*) specifications. For both of these specifications, the EZ program feature that matters is requiring local communities (that qualify for zone designation) to submit strategic business development plan as part of the application process. Mandating communities to develop a strategic business plan is found to marginally enhance the baseline growth of shipments by 6.48 percentage points per year and is found to enhance capital expenditure growth by 9.56 percentage points a year.

Table 7

[7] Mean and standard deviation for the zone land coverage of the five states in the data sample are (0.042) and (0.022), respectively. Thus the estimated figure of 5.6 percentage points is obtained as:
-0.056=(-0.1295*0.022*100)/5

[8] -0.042 = (-0.096*0.022*100)/5.

[9] -0.040 = (-0.093*0.22*100)/5

Vanishing-establishment outcomes- When the impact of zone designation and zone policy features is estimated on the employment and business outcomes accounted for by vanishing establishments, none of the EZ specific policy features considered has a significant impact on either the baseline employment loss or on the loss of production and capital expenditure.

Discussion of the Results and Policy Implications

The analysis performed took a close look at the states' EZ experience to determine whether different impacts of EZ programs might be detected by separately looking at outcomes accounted for by new, existing or vanishing establishments, as different zones might either target the attraction of new establishments, the expansion of existing establishments, or the retention of businesses in struggling areas. When outcome measures are separated in this way, results from the analysis show that EZ programs have different impacts on different types of establishments. Zone designation is found to increase the growth of jobs, production and capital expenditure brought by new establishments. Employment and business outcomes accounted for by existing establishment are also positively affected by selected policy features, though to a very small extent. Zone designation is instead found to have no impact on slowing down the loss of employment, production and capital investment, accounted for by vanishing establishment.

There are various possible explanations for these findings. New businesses could simply increase the rate at which previously existing businesses leave the area (Greenbaum 1998). New jobs and economic activity are much more headline grabbing than the retention or salvage of existing jobs and economic activity. New economic activity is quickly used to emphasize the merit of EZ programs, while business closures are often unlikely to be linked to zone designation. As a result, zone incentives might be marketed more toward attracting new establishments than toward helping struggling existing ones.

The greatest relevance of these findings, however, is perhaps the strong indication that the proposed method of analysis can be used as an effective tool to test a number of predictions that economist and practitioners have long expressed on economic development initiatives. For the U.S. Enterprise Zone (EZ) programs such predictions concern a number of policy characteristics that these programs (and economic development programs in general) should have in order to be most effective when efforts are primarily targeted at attracting new businesses and when efforts are instead targeted at retaining existing ones (e.g. Bostic 1996, Papke 1993, wilder and Rubin 1996). Although being potentially very important to refine future economic development efforts, these types of predictions have never been supported by any solid empirical analysis. Taking advantage of the decentralized implementation of the U.S. Enterprise Zones, the findings retrieved from the analysis offer important empirical evidence to specifically support three of such predictions:

I) Programs with fewer target areas are more effective in attracting new jobs and business activity- The results of the analysis show that states that have lower zone land coverage are found to attract more employment and economic activity accounted for by newly attracted establishments. This finding provides support to the prediction that geographically-targeted economic development programs are more successful in attracting new businesses if they restrict the number (and the size) of the designated target areas. This is because a more competitive site selection process can allow program officials to better evaluate the potential comparative advantage of the different eligible areas (Erickson and Friedman 1990a, 1990b). In this way, program officials would be able to designate the areas that have developed the strongest local support for economic growth. A more conservative attitude in the designation process of target areas is also considered beneficial for facilitating a closer monitoring and evaluation of the implementation of the program, allegedly improving its ultimate efficacy in attracting new businesses (Wilder and Rubin 1996).

II) Employment growth in existing target businesses is promoted only if program incentives are tied to hiring requirements- It has been pointed out (Papke 1993) that tax incentives (as other zone incentives) may have also an impact on factor prices. Incentives that reduce the price of capital goods may increase production and employment by lowering costs, but they may also have a substitution effect by inducing businesses to substitute capital for labor. Programs that tie tax incentives awarded to zone businesses to the number of new jobs created, therefore, are believed to be more effective in promoting local employment growth than programs that tie incentives to capital investments (Wilder and Rubin 1996). Moreover, tax incentives are expected to appeal more to established businesses than to start-ups, since new businesses do not typically expect to make profits in the first years of operation (Sheldon and Elling 1989). Thus, programs that ties tax incentives to job creation, in particular, are predicted to benefit zone employment specifically when the target of zone designation are existing establishments.

The results of the analysis presented in the paper support this prediction. Tying incentives to job creation is found to promote employment growth in existing zone businesses, while it is not found to have a significant impact when the evaluation focuses either on the employment growth accounted for by new businesses established in zone areas or on sale and capital expenditure growth.

III) Programs with strategic planning requirements are more effective in promoting production and investment growth in existing target businesses- The strategic planning portion of the application process to designate the target areas of the program intervention has been regarded as a key positive feature of those regional economic development initiatives specifically aimed at boosting the economic activity of existing target businesses (Bostic 1996). As the development of a zone strategic plan often gathers together local businesses with different administrative and community branches, existing zone businesses become more aware of the program benefit (and of the growth opportunity offered by the program) if they are located in states (or regions) that mandate the submission of such a plan rather than if they are located in states (or regions) that do not mandate such a submission. The provision of a strategic business plan, instead, is not predicted to be a relevant policy feature for those programs that specifically target the attraction of new businesses into the target areas (rather than targeting existing businesses). For these types of programs marketing efforts and the total territorial extension of the target areas are predicted to be by large the most relevant factors. In this paper the provision of a business plan has been specifically operationalyzed and included in the empirical model, allowing such predictions to be tested. The results from the analysis highlight that requiring a business plan as part of the zone application process is beneficial for inducing growth in the value of shipments and capital investment recorded by existing establishments, while it does not significantly affect the growth of the economic activity brought by new businesses.

Conclusion

This paper proposes an empirical method to evaluate the performance of decentralized economic development programs implemented across different regions or states. The proposed evaluation design is a comparative model that investigates the impact of selected heterogeneous regional (or state) policy implementation features on employment and other business outcomes.

The method of analysis is illustrated and tested through an empirical application: the evaluation of the U.S. state Enterprise Zone (EZ) programs. By carefully operationalizing the differences in the state-specific EZ policy implementation features, and by adequately controlling for differences in the pre-designation characteristics of target and excluded areas, the proposed evaluation design provides findings that have significant policy implications to effectively refine future geographically-targeted economic development initiatives. The findings from this empirical application show that the proposed evaluation design is an effective tool for turning the heterogeneity of decentralized economic development programs from a threat to the validity of the analysis into a great opportunity for testing the effectiveness of a variety of region (or state) specific policy implementation features.

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Tables

Table 1. Program Implementation Features, starting dates and number of zones

				CA [(a)]	*KY*	*NY*	*PA*	*VA*
		Program starting date		1986	1983	1987	1983	1982
		Number of zones in existence at 31/12/1992		28	10	19	51	24
Policy feature	*Variable name*	*Measure*		*CA* [(a)]	*KY*	*NY*	*PA*	*VA*
Zone eligibility is conditional to the submission of an application complete with a strategic development plan	STRPL	1=yes	0=no	0	0	1	1	1
Tax incentives to EZ businesses are proportional to the number of new jobs created	JOBS	1=yes	0=no	1	1	0	0	0
Tax incentives to EZ businesses are proportional to the amount of new capital investment	CAP	1=yes	0=no	0	1	1	0	0
Total surface occupied by EZ areas as a percentage of the total state land size	LAND	% of state land occupied by zone-ZIPs[(b)]		1.26 3.45	2.51 3.22	0 2.31	0.21 6.46	5.37 7.91
Monetary value of the incentive package offered to EZ businesses	MON	ΔIRR(%points) btw. EZ and non-EZ loc. within the same state[(c)]		0,115	0,217	0,183	0,229	0,735

Notes:

(a) California has two EZ programs that, respectively, established the Enterprise Zones and the Employment and Economic Incentive Areas. Since the two programs do not differ from each other in the policy dimensions considered in this paper, they are considered as a single program.

(b) The land coverage variable (LAND) is time-varying. The upper range value of the measure reflects the % of state land occupied by EZs in 1992. The lower range value reflects the same % in 1987.

(c) ΔIRR values vary across industries. The reported figure is the state average obtained by weighing each two-digit SIC specific estimate by the proportion of establishments in the state operating in that industry prior to the start of the EZ program.

Table 2. Pre-Designation ZIPs' Characteristics (1980 Decennial Census data)

Variable	Variable name	Mean (S.D.)	
		Zone ZIPs (EZ=1)	Non-zone ZIPs (EZ=0)
CEN80			
Unemployment rate	UNEMP	0,049 *(0.018)*	0.045 *(0.019)*
Per capita income (in $)	INCOME	6035 *(1.551)*	6630 *(2.129)*
Poverty rate	POVRT	0.167 *(0.098)*	0.130 *(0.081)*
Population density (1,000 people per km2)	POPDNS	1.87 *(2.88)*	0.80 *2.90*
Proportion of population black or hispanic	MINRTY	0.274 *(0.293)*	0.099 *(0.164)*
HOUS80			
Proportion of number of occupied units over total number of housing units	HS_OCC	0.864 *(0.071)*	0.896 *(0.125)*
Average value of owner occupied housing units (in $)	HS_VAL	47930 *(24.361)*	61.314 *(32.320)*
CM77_82 [=ln(Y_{i1982} / Y_{i1977})]			
Employment growth	EMP_GRW	-0.007 *(0.722)*	0.231 *(0.987)*
Establishment growth	EST_GRW	0.558 *(0.768)*	0.793 *(1.168)*

Table 3. Outcome variables by types of establisments

Variable	Variable name	Average 5-year growth rate [(87-82) and (92-87)]
Outcomes due to birth-establishments [i.e. new business activity at time t accounted for by the new establishments opened in the period t-(t-5)].		
Employment	EMP_BTH	0,086 (1.522)
Value of shipments	SHP_BTH	0.275 (1.891)
Capital expenditures	CEXP_BTH	0.217 (1.857)
Outcomes due to exisitng-establishments [i.e business activity at time t accounted for by the establishemts existing both at time t and t-5)		
Employment	EMP_EXT	0.001 (0.765)
Value of shipments	SHP_EXT	0.211 (0.967)
Capital expenditures	CEXP_EXT	0.157 (1.354)
Outcomes due to vanishining-establishments (negative values) [i.e. business activity loss at time t accounted for by the death of establishments in the period t-(t-5)		
Employment	EMP_VAN	0.242 (1.582)
Value of shipments	SHP_VAN	0.476 (1.964)
Capital expenditures	CEXP_VAN	0.307 (1.878)

S.D. are in parentheses

Table 4. Model specifications for eq. (5)

Specifications	*Group of dependent variables*	*Dependent variable*			*Policy implementation features: (EZ*MON) and (EZ*POL) =*
(I.1)-(III.4)	Birth-establishment outcomes	**EMP_BTH (I)**	**SHP_BTH (II)**	**CEXP_BTH (III)**	(I.1), (II.1), (III.1) EZ*STRPL (I.2), (II.2), (III.2) EZ*JOBS (I.3), (II.3), (III.3) EZ*CAP **(I.4), (II.4), (III.4) EZ*LAND**
(IV.1) - (VI.4)	Exisitng-establishment outcomes	**EMP_EXT (IV)**	**SHP_EXT (V)**	**CEXP_EXT (VI)**	(IV.1), **(V.1), (VI.1) EZ*STRPL** **(IV.2)**, (V.2), (VI.2) **EZ*JOBS** (IV.3), (V.3), (VI.3) EZ*CAP (IV.4), (V.4), (VI.4) EZ*LAND
(VII.1) - (IX.4)	Vanishining-establishment outcomes (negative values)	EMP_VAN (VII)	SHP_VAN (VIII)	CEXP_VAN (IX)	(VII.1), (VIII.1), (IX.1) EZ*STRPL (VII.2), (VIII.2), (IX.2) EZ*JOBS (VII.3), (VIII.3), (IX.3) EZ*CAP (VII.4), (VIII.4), (IX.4) EZ*LAND

Table 5. Probability of Zone Designation
Probit estimates from eqs. (3) and (4)

Variables[(a)]		Cluster I (CA, KY, PA). Eq. (3)	Cluster II (NY, VA). Eq. (4)
CEN80			
Unemployment rate	UNEMP	-1.194 *(2.230)*	-0.919 *(2.658)*
Per capita income (in $)	INCOME	**-0.071**** ***(0.033)***	0.045 *(0.059)*
Poverty rate	POVRT	0.823 *(0.787)*	0.732 *(1.159)*
Population density (1,000 people per km2)	POPDNS	**0.105***** ***(0.022)***	0.009 *(0.015)*
Proportion of population black or hispanic	MINRTY	**1.692***** ***(0.241)***	**0.760**** ***(0.328)***
HOUS80			
Proportion of number of occupied units over total number of housing units	HS_OCC	-	-0.437 *(0.578)*
Average value of owner occupied housing units (in $)	HS_VAL	-	**-0.020***** ***(0.005)***
CM77_82 [=ln(Y_{i1982} / Y_{i1977})]			
Employment growth	EMP_GRW	**-0.127*** ***(0.067)***	**-0.145**** ***(0.083)***
Establishment growth	EST_GRW	0.027 *(0.115)*	0.167 *(0.153)*
Number of observations		2352	1581
Pseudo R2		0.1517	0.1537
Log likelihood		-721.49	-335.68

* p-value<0.1 ** p-value<0.05 *** p-value<0.01
Standard errors are in parentheses
(a) For clarity of exposition, the coefficient estimates on the state dummies are not reported.
The complete list of regression results is available upon request

Table 6. Estimated zone impact on five-year growth rates. Birth-establishment outcomes. Results from equation (5). Policy implementation variables: MON, LAND

Independent Variables[(a)]		Specification (I.4) Dep.var. EMP_BTH	(II.4) Dep.var. SHP_BTH	(III.4) Dep.var. CEXP_BTH
ZONE DESIGNATION				
Portion of the five-year period ending at time t in which a zone has been in existence	EZ_T_TD5	**0.629*** (0.214) *0.003***	**0.296* (0.168) *0.070***	**0.306* (0.193) *0.091***
ZONE POLICIES				
Monetary value of zone incentives	EZ*MON	0.619 (0.603) *0.305*	0.377 (0.756) *0.618*	1.070 (0.743) *0.150*
Portion of state land covered by zones [0=0%; 100=100% coverage]	EZ*LAND	**-0.129** (0.051) *0.012***	**-0.096* (0.044) *0.059***	**-0.093** (0.033) *0.039***
Number of observations		5368	5368	5368
Adjusted R2		0.0219	0.0039	0.0043
F		13.01	3.12	3.33
Prob>F		0.0000	0.0006	0.0003

* p-value<0.1 ** p-value<0.05 *** p-value<0.01

Standard errors are in parentheses, P-values are in Italics.

(a) For clarity of exposition, the coefficient estimates on the state dummies, the propensity scores, and the (1982-87) five-year period dummy are not reported.
The complete list of regression results is available upon request

Table 7. Estimated zone impact on five-year growth rates. Existing-establishment outcomes. Results from equation (5). Policy implementation variables: MON, JOB, BUSPLAN

Independent Variables[(a)]		Specification (IV.2) Dep.var. EMP_EXT	(V.1) Dep.var. SHP_EXT	(VI.1) Dep.var. CEXP_EXT
ZONE DESIGNATION				
Portion of the five-year period ending at time t in which a zone has been in existence	EZ_T_TD5	0.153 (0.106) *0.150*	0.123 (0.107) *0.250*	**0.264*** **(0.150)** ***0.079***
ZONE POLICIES				
Monetary value of zone incentives	MON	-0.295 (0.250) *0.238*	0.460 (0.315) *0.145*	-1.185 (0.744) *0.208*
Tax incentives tied to job creation	JOB	**0.227**** **(0.102)** ***0.027***	-	-
Business plan	STRPL	-	**0.324**** **(0.129)** ***0.012***	**0.478***** **(0.182)** ***0.009***
Number of observations		7352	7352	7352
Adjusted R2		0.0252	0.0292	0.0189
F		18.95	23.07	15.16
Prob>F		0.0000	0.0000	0.0000

* p-value<0.1 ** p-value<0.05 *** p-value<0.01

Standard errors are in parentheses, P-values are in Italics.

(a) For clarity of exposition, the coefficient estimates on the state dummies, the propensity scores, and the (1982-87) five-year period dummy are not reported.
The complete list of regression results is available upon request

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